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The CANTEEN study: Evaluation of the current free school meal policy in UK secondary schools

Submission date
16/10/2023

Recruitment status
No longer recruiting

Registration date
24/10/2023

Overall study status
Completed

Last Edited
24/11/2026

Condition category
Nutritional, Metabolic, Endocrine

[X] Prospectively registered
[X] Protocol
[_] Statistical analysis plan
[_] Results
[_] Individual participant data
[X] Record updated in last year

Plain English summary of protocol
Background and study aims
Not having enough money to buy food is known as food insecurity and is common in UK children. Free school meals (FSM) are offered to children based on household income. Although all schools offer FSM, about 1 in 5 pupils do not take up their meal. There are also differences between schools in how many pupils take up FSM. It is not understood what influences whether pupils take up their FSM in different schools, how FSMs are related to the quality of the food children eat and whether schools with higher uptake of FSM have pupils with better diets than pupils in schools with lower uptake of FSM. Understanding these things will help us to improve the policy of offering FSM to look after the most nutritionally vulnerable children in society. The CANTEEN study aims to look at how differences in FSM uptake in schools relate to the food children eat, the quality of this food, and their food insecurity. The study will also investigate how expensive different levels of FSM uptake would be. It will then examine whether schools with higher FSM uptake have different ways of offering FSM compared to lower FSM uptake schools and whether this understanding can be used to support schools to change FSM provision. Finally, the study will explore whether changing who qualifies for FSM impacts the food eaten and food insecurity.

Who can participate
Pupils aged 11-12 and 14-15 years old will be recruited from secondary schools in Northern Ireland and the Midlands, UK, (school years 7 and 10 in the Midlands and years 8 and 11 in Northern Ireland; n=1440), and their parents and school staff.

What does the study involve?
Data collection will include pupils completing an online diet survey, gathering information on FSM/food costs, observing the school canteen, and reviewing school documents on FSM, school food and wider school issues. Staff members (e.g. headteacher, catering manager, business manager), school governors and parents will complete a questionnaire to explore their views and experiences of FSM. More detailed information, including discussions with key school staff, parents and pupils, will be collected in 6-8 of these schools. These data will look at how attending a school with different levels of FSM uptake is associated with the food pupils eat, both at school and outside of school. The analysis will also work out whether the benefits of offering FSM outweigh the costs. The questionnaires, interviews, and focus groups will explore

key issues producing a high FSM uptake and whether this information could be used to help other schools optimise how FSM are delivered.

What are the possible benefits and risks of participating?
The results will assess the impact of the means-tested FSM policy in secondary schools on diet quality and food insecurity. This information will be used to inform regional Departments for Education and Health to enable further development of national policy relating to school food and FSM provision. In turn, this may help to shape the health of future secondary school pupils.

Schools will receive a monetary reward (£500) to participate and £5 for every completed parent questionnaire. Schools that participate in the case study will receive an extra £500. Pupils and parents will also receive vouchers worth £5 and £15, respectively, as a 'thank you' for taking part in the study. Schools will be provided with a report summarising findings on school systems to support the optimisation of FSM provision and pupil views of school food. The process of collecting the views of pupils, parents, staff, business managers and governors will also provide an additional method for the school to ensure their voices on school food provision and education are heard.

There are no anticipated risks to those taking part in this study.

Where is the study run from?
Queen's University Belfast (UK)

When is the study starting and how long is it expected to run for?
January 2023 to June 2025

Who is funding the study?
National Institute for Health and Care Research (NIHR) (UK)

Who is the main contact?
1. Professor Jayne V Woodside, j.woodside@qub.ac.uk
2. CANTEEN study team, canteenstudy@qub.ac.uk

Contact information

Type(s)
Scientific, Principal investigator

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Public

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Additional identifiers

Study information

Scientific Title
The CANTEEN study: Free school meals, diet quality and food insecurity in secondary school pupils: a mixed methods study

Acronym
CANTEEN study

Study objectives
Food insecurity is common in children; 19% of UK children aged <15 years old live in moderate-severely food insecure households, and food insecurity is consistently linked with poor health outcomes. Free school meal (FSM) provision is a government-implemented means-tested strategy intended to improve food insecurity and nutrition and reduce dietary inequalities. FSM eligibility is increasing, with concerns that food-insecure children are not always eligible for FSM based on current criteria. FSM uptake is also variable, with 20% of eligible secondary pupils not taking FSM.

Little research has examined the impact of the current means-tested FSM policy on food intake, diet quality and food insecurity, particularly at the secondary school level. Evidence of the effectiveness of the current FSM policy is essential to support the status quo, but also to inform recently proposed changes (e.g. change in eligibility criteria or universal provision). In addition, little is known about what influences whether FSM-eligible children take these up.

This study aims to evaluate the effectiveness and cost-effectiveness of the current means-tested FSM policy in UK secondary schools on diet and food insecurity outcomes, understand what factors affect uptake, and generate a robust evidence base for proposed policy change to be tested.

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 06/10/2023, Faculty of Medicine, Health and Life Sciences Research Ethics Committee, Queen's University Belfast (University Road, Belfast, BT7 1NN, United Kingdom; None provided; facultyrecmhls@qub.ac.uk), ref: MHLS 23_55

Primary study design
Observational

Study design
Observational mixed-methods study

Study type(s)
Prevention

Health condition(s) or problem(s) studied
Diet quality in secondary schoolchildren

Interventions
This observational research consists of two stages. In the first stage, a variety of pupil- and parent-level outcomes will be collected alongside school-level data and factors from 32 schools in Northern Ireland and England.
An observational study will be undertaken (n=32 secondary schools; n=1440 pupils from two sites in Years 7 and 10 (England) and Years 8 and 11 (Northern Ireland)) utilising the variation in the proportion of eligible pupils taking up FSM. Pupil- (dietary intake using INTAKE24, school food choices, FSM eligibility and uptake, food insecurity) and parent-level outcomes (FSM eligibility and uptake, food insecurity and school food views and experiences) will be collected alongside school-level data and factors.
Multi-level modelling will be used to evaluate the association between school-level FSM uptake and fruit and vegetable (FV) intake, overall diet quality, and food insecurity in all pupils, irrespective of FSM status, also exploring aggregated attendance and educational attainment data. An exploratory comparison of FSM eligible pupils who take FSM versus FSM eligible pupils who do not take FSM will also be undertaken to assess the effect of FSM uptake at an individual level on FV intake, diet quality, and food insecurity. Economic analysis of FSM uptake will be conducted using a cost-utility approach. Proposed policy changes to extend FSM eligibility and uptake will be modelled to explore effects on FV intake, overall diet quality and food insecurity.
In the second stage, a representative subset of the recruited schools (n=6-8) will participate in an in-depth qualitative evaluation conducted with school staff, parents (interviews) and pupils (focus groups), alongside school food policy and environment data collection to assess barriers and facilitators and characterise schools with different levels of FSM uptake.

Intervention Type
Other

Primary outcome(s)
Fruit and vegetable (FV) intake (n portions) measured using INTAKE24, an online self-completion 24-hour dietary recall tool that is based on the multiple pass method over 24 h. A minimum of one and a maximum of two (non-consecutive) dietary recalls on school days will be undertaken for each pupil participant, with a mean value taken when two recalls are completed.

Key secondary outcome(s)
A range of other dietary measures (in addition to the primary outcome) will also be assessed through the INTAKE24 tool, administered as described above:
1. Overall diet quality measured using the validated Diet Quality Index for Adolescents (DQI-A) (24 h), which comprises three components (diet quality, diversity and equilibrium)
2. Fruit and vegetable (FV) intake at school
3. Meeting the FV 5-a-day recommendation
4. Intake of total energy (kcal), dietary fibre, free sugars, and other key micro- and macronutrients. Nutrients will be measured as micro/mg/grams and also expressed as a percentage of energy intake for food consumed both at school and over 24 h.
5. Food insecurity data will be collected from parents using an 18-item household food security module and pupils using a 9-item Child Food Security Survey Module (both USDA)
6. Pupil quality of life measured using a Child Health Utility 9D questionnaire
7. School attendance and educational attainment data will be collected at a school level and used as an aggregated outcome.

Other data will be collected to allow understanding of both the overall school and the school food environment and context and to address study aims, including analysis of cost-effectiveness and understanding factors that influence school uptake.
These data will include:
1. Pupil free school meal (FSM) eligibility and uptake, usual school lunch consumption, other pupil characteristics and money spent on food outside of school measured using pupil and school surveys
2. Child FSM eligibility, child's usual food choices, FSM perceptions, usual home food practices and expenditure measured using a parent survey
3. Economic analysis: A cost-utility analysis of FSM participation will be undertaken using cost data collected from schools measured using questionnaires and interviews and pupil completion of the Child Health Utility 9D (Paediatric Quality of Life) questionnaire.
4. Barriers and facilitators to FSM uptake and school food systems measured using qualitative focus group discussions with pupils, parents and school staff.

Other data will be collected to inform both stages of the study, including the case studies and typology development: the school eating environment will be observed and observation checklists completed; key school documents and policies (including school promotion of FSMs, FSM eligibility, FSM uptake, school meal data and food offered, school meal uptake, registration processes for FSMs, school food policies, other relevant school policies and relevant inspection reports) will be explored; FSM implementation and wider contextual/school food system influences (school leadership, school/parent engagement, pupil consultation mechanisms) will be measured using school staff/governor/caterer questionnaires.

Completion date
30/06/2025

Eligibility

Key inclusion criteria
All pupils from the recruited schools and selected classes (i.e. years 7 and 10 in England and years 8 and 11 in Northern Ireland) will be eligible to participate. Their parents and relevant school stakeholders from eligible schools will also be eligible to participate.

Participant type(s)
Healthy volunteer

Healthy volunteers allowed
No

Age group
Child

Lower age limit
11 Years

Upper age limit
15 Years

Sex
All

Total final enrolment
1668

Key exclusion criteria
1. Secure and pupil referral units
2. SEN schools
3. Non-English language speaking schools

Date of first enrolment
01/11/2023

Date of final enrolment
31/03/2025

Locations

Countries of recruitment
United Kingdom

England

Northern Ireland

Study participating centre
Centre for Public Health
Institute of Clinical Science
Grosvenor Road
Queen's University Belfast
Belfast
Northern Ireland
BT12 6BJ

Study participating centre
Institute of Applied Health Research
Murray Learning Centre
University of Birmingham
Edgbaston
Birmingham
England
B15 2TT

Sponsor information

Organisation
Queen's University Belfast

ROR
https://ror.org/00hswnk62

Funder(s)

Funder type
Government

Funder Name
National Institute for Health and Care Research

Alternative Name(s)
National Institute for Health Research, NIHR Research, NIHRresearch, NIHR - National Institute for Health Research, NIHR (The National Institute for Health and Care Research), NIHR

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan

The datasets generated during and/or analysed during the current study are available upon reasonable request from the corresponding author, Professor Jayne V Woodside, j.woodside@qub.ac.uk. After the publication of the main findings of the study, the Chief Investigators will consider external requests to gain access to anonymised data. The dataset will be preserved and available for this purpose for a minimum of 10 years following the end of the study. Those requesting data will be asked to provide a brief research proposal including the objectives, timelines, intellectual property rights, and expected outputs, and a Data Sharing Agreement between Queen's University Belfast and the requestor will be drawn up. Requestors will be required to acknowledge the research team and funders as a minimum and consider co-authorship of any publications arising from the data. Permission for anonymised data to be shared for the purpose of future academic research will be sought from all participants via the informed consent form.

IPD sharing plan summary

Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Protocol article		20/10/2025	24/11/2026	Yes	No
Participant information sheet	version 3.0	26/09/2023	18/10/2023	No	Yes
Participant information sheet	version 3.0	26/09/2023	18/10/2023	No	Yes
Participant information sheet	version 3.0	26/09/2023	18/10/2023	No	Yes
Participant information sheet	version 3.0	26/09/2023	18/10/2023	No	Yes
Participant information sheet	version 3.0	26/09/2023	18/10/2023	No	Yes
Protocol file	version 3.0	26/09/2023	18/10/2023	No	No
Protocol file	version 9.0	11/11/2024	11/03/2025	No	No
Protocol file	version 11.0	03/03/2025	16/06/2025	No	No
Study website	Study website	11/11/2025	11/11/2025	No	Yes